AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-21 (Canceled).

22. (Currently amended) A computer ~~An computer~~ system for solving an interval global optimization problem specified by a function f and a set of equality constraints, the computer system comprising:

a processing unit;

a memory;

an interval arithmetic unit within the processing unit, wherein the interval arithmetic unit is configured to receive floating-point numbers representing a first endpoint and a second endpoint for a first interval and floating-point numbers representing a first endpoint and a second endpoint for a second interval, and is configured to ~~simultaneously~~ perform arithmetic operations to produce a first endpoint and a second endpoint representing a resulting interval;

wherein computational code within the memory is configured to perform an interval global optimization process to compute guaranteed bounds on a globally minimum value of the function $f(\mathbf{x})$ subject to the set of equality constraints;

wherein the interval global optimization process is configured to,

apply term consistency to the set of equality constraints over a subbox **X**, and to

exclude portions of the subbox **X** that can be shown by using term consistency to violate any of the equality constraints, wherein using term consistency involves intersecting the first interval with an inverse of a function derived from the first interval.

23. (Previously presented) The computer-system of claim 22,

wherein the interval arithmetic unit includes a first input, wherein the first input includes a first floating point number representing a lower bound of the first input and a second floating point number representing an upper bound of the first input; and

wherein the interval arithmetic unit includes a second input, wherein the second input includes a third floating point number representing a lower bound of the second input and a fourth floating point number representing an upper bound of the second input.

24. (Previously presented) The computer-system of claim 22, wherein the optimizer is configured to:

precondition the set of equality constraints through multiplication by an approximate inverse matrix **B** to produce a set of preconditioned equality constraints;

apply term consistency to the set of preconditioned equality constraints over the subbox **X**; and to

exclude portions of the subbox **X** that can be shown to violate any of the preconditioned equality constraints.

25. (Previously presented) The computer-system of claim 22, wherein the optimizer is configured to:

keep track of a least upper bound f_bar of the function $f(\mathbf{x})$;

unconditionally remove from consideration any subbox for which $inf(f(\mathbf{x})) > f\_bar$;

apply term consistency to the inequality $f(\mathbf{x}) \leq f\_bar$ over the subbox **X**; and to

exclude portions of the subbox **X** that violate the inequality.

26. (Previously presented) The computer-system of claim 22, wherein the optimizer is configured to:

apply box consistency to the set of equality constraints $q_i(\mathbf{x}) = 0$ $(i=1,...,r)$ over the subbox **X**; and to

exclude portions of the subbox **X** that violate the set of equality constraints.

27. (Previously presented) The computer-system of claim 22, wherein the optimizer is configured to:

evaluate a first termination condition;

wherein the first termination condition is TRUE if a function of the width of the subbox **X** is less than a pre-specified value, ε_X, and the absolute value of the function, f, over the subbox **X** is less than a pre-specified value, ε_F; and to

terminate further splitting of the subbox **X** if the first termination condition is TRUE

28. (Previously presented) The computer-system of claim 22, wherein the optimizer is configured to perform an interval Newton step on the John conditions.